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ABSTRACT

Researchers examined the first in-class essays and the final exam essays of 24 freshman writing students to determine the syntactic maturity these students gained during an eight-month period. Counting the words, T-units, clauses, and sentences for each of the 48 essays created data about mean words per T-unit, clauses per T-unit, words per clause, T-units per sentence, and words per sentence. Although the data indicated growth in syntactic maturity between the writing of the first and second essays, only the increase in the mean number of words per T-unit reached statistical significance. Calculations for four additional variables (words per subordinate clause, number of words between embeddings of all kinds, number of words between prepositional embeddings, and the number of words between nonclausal and nonprepositional embeddings) indicated that part of the increase in syntactic maturity was attributable to an increased number of subordinate clauses and a significantly higher percentage of prepositional embeddings in the second essay. The variables that measure embedding frequency may be more precise measures of syntactic maturity gains than the T-unit variables, but they should be used over longer periods of time and with larger samples than in this study. (RL)

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Syntactic Maturity in the Writing of College Freshmen*

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Measuring growth in the writing behaviors of college freshmen is a time-consuming yet necessary task if teachers of writing and directors of writing programs are to adjust instructional strategies to the needs of the students they serve. Yet so few normative studies of such growth are available that it is both extremely difficult to determine what growth should be expected and which instructional strategies might be used to enhance positive change. The present study is designed to provide normative data on the syntactic maturity of a group of college freshmen. It is hoped that these data, together with the analyses of them and the discussions of their implications for teaching and research, will assist teachers of freshmen writing in assessing the effectiveness of their own courses and programs.

Previous Research

The research of several investigators has influenced our examination of syntactic maturity in the writing of college freshmen. Most notable is the work of Hunt (1965, 1970, 1977) who first used mean T-unit length—a T-unit being defined as "one main clause plus any subordinate clause or nonclausal structure that is attached to or embedded in it" (1970)—as an

easily calculated index sensitive enough to detect gains over time in syntactic maturity. Following Hunt's 1965 study, which ascertained the respective levels of syntactic maturity for fourth, eighth, and twelfth graders and for skilled adults who had published in magazines like Atlantic Monthly, the T-unit was used by O'Donnell, Griffin, and Norris (1967) in their normative study of syntactic growth in the spoken and written language of pre-secondary children and in their comparison of the syntax of the written and spoken language of three sub-groups within their sample population. The same index of syntactic maturity figured importantly in the O'Hare (1973) and Combs (1976) studies of the effects of sentence-combining practice on student writing. Apart from the successful use of the T-unit in a number of studies, its sensitivity to changes in syntactic maturity is further suggested, as O'Donnell (1977) pointed out, because it is almost identical to the unit which Loban (1976) employed to measure syntactic growth in a group of schoolchildren as they progressed from kindergarten through the twelfth grade. In addition to being sensitive to changes in syntactic maturity, the T-unit is a very practical measure, since it does not require an inordinate amount of time to calculate and since it reflects changes which can be measured only through the use of indices demanding more of the researcher's time. The practicality of the T-unit has been urged by Hunt (1965, 1970, 1977) and by O'Donnell (1976) in his critique of Endicott's Syntactic Density Scale (1973) and the Syntactic Density Score of Golub and Kidder (1974, 1975). Although most sensitive to increases in syntactic maturity, the T-unit is not the only index employed by Hunt and others. In addition to significant growth over time in mean T-unit length, Hunt (1965, 1970) reported significant gains along the dimensions of mean clause length and mean number of clauses per T-unit, gains which are supported by the

findings reported in the O'Donnell, Griffin, and Norris (1967) study and the Loban (1976) study. Much less sensitive to growth in syntactic maturity but nonetheless useful as indicators of such growth are, according to Hunt (1970), mean T-units per sentence and mean words per sentence.

Although the usefulness of these measures appears fairly well established, precious little effort has been expended in identifying growth in syntactic maturity in the writing of college freshmen. Indeed, we are aware of no such study, even though most universities and colleges have writing programs of one kind or another for their freshmen students, programs which, we assume, aim at increasing the student's ability to use the language fluently in writing.

Hypothesis and Design

Because it was designed to identify what might be normal growth among college freshmen in syntactic maturity, the present study attended primarily to but one hypothesis: significant growth in syntactic maturity, defined according to Hunt's five indices, occurs over the eight-month period the student spends in a freshman writing program.

The design of the study required the analysis of the first and last in-class writing assignments for twenty-four randomly selected students from the 1976-1977 freshman class of Oklahoma State University, a large, multi-purpose, Land Grant institution where completion of a six semester-hour sequence in freshman writing is necessary for graduation. The mean ACT scores for the twenty-four students are as follows: English, 17, the scores ranging from a low of 08 to a high of 28; Mathematics, 21, ranging from 04 to 35; and Composite, 20, ranging from 08 to 28. These mean ACT

scores were judged typical of the ACT scores of all freshman who had not received advanced standing credit in college writing. All students were full-time students, carrying a minimum of twelve semester hours of course-work at the freshman and sophomore levels. None of the students involved and none of the thirty-one teachers of writing who instructed those students knew the present study was being conducted. No student had the same writing instructor for both courses in the two-course sequence. Only two of the twenty-four students were classed as minority students.

In the Fall of 1976, the students were enrolled in the first course in the required two-course sequence. This first course was divided into roughly three five-week periods. During the first five-week period, emphasis was placed on structuring and developing essays. During the second period, style and conventional usage were major concerns, while skills in structuring and developing essays were constantly reinforced through writing assignments. The focus of the third period was on collecting and using secondary material in writing assignments; again, the specific writing assignments made during the third period were geared toward further development of the skills emphasized during the earlier periods of the course.

Although during the Spring of 1977 the students chose one of eight thematic courses with which to complete the six-hour composition requirement, all of the eight second courses built on the first course in the sequence, provided the opportunity for students to refine and improve the writing skills they had developed earlier, and encouraged students to acquire, through extensive reading and writing assignments, a more or less thorough knowledge of a given thematic area.

Because of the careful administration of the two-course sequence, a great deal of uniformity obtained among the various sections of the first and second courses. Students in both courses were required to submit to

their instructors eight to ten thousand words in essay form in addition to, in some cases, a comparable number of words written for journals and/or minor writing assignments. Thus each student wrote a minimum of approximately sixteen thousand words during the two-course sequence. Except for very limited formal instruction on how little sentences grow into larger ones, no student received anything approaching systematic instruction in sentence-combining techniques; and no student was required to complete sentence-combining exercises, although each teacher did spend some time showing students how to combine sentences in their own essays effectively. Although certain of the teachers were most assuredly better than other teachers, the random selection of students in this study precluded our controlling for that variable.

Procedures

During the Summer of 1977, we randomly selected from files of student essays the first in-class essays of twenty-four students. These essays were written during the first week of September, 1976, in the first of the two required freshman writing courses. After identifying which class each student had enrolled in for the subsequent Spring Semester, we collected the last in-class essays which those students had written during their second freshman writing course. These second essays had been written during a two-hour final examination period during the second week of May, 1977. Thus a little more than eight months had passed between the writing of the first and second essays. For each of the forty-eight essays, we initially counted words, T-units, clauses, and sentences. These raw data were then used to compute five variables—mean words per T-unit, clauses per T-unit,

words per clause, T-units per sentence, and words per sentence. Paired T-Tests were then performed to determine whether or not significant group gains along these dimensions had been realized between the writing of the first and second essays.

Results and Interpretation

Our analyses of the data only partially confirmed our hypothesis.

The means and standard deviations for the five indices of syntactic maturity for each of the two essays are reported in Table 1. It should be pointed out that the mean number of words for the first essay is 417 and that the mean for the second is 583.

VARIABLE	MEAN	S.D.
Words/T-units		
Essay 1	14.0658	2.793
Essay 2	15.3129	2.826
Words/Clauses		
Essay 1	8.7224	1.811
Essay 2	9.2441	1.233
Clauses/T-units		
Essay 1	1.6300	0.222
Essay 2	1.6563	0.206
T-units/Sentences		
Essay 1	1.1431	0.107
Essay 2	1.1146	0.087
Words/Sentences		
Essay 1	16.0738	3.523
Essay 2	17.0417	3.412

Table 1. Means and Standard Deviations for Five Indices of Syntactic Fluency.

Examination of these means reveals that words per T-unit, words per clause,

clauses per T-unit, and words per sentence increased over the eight-month period and that the number of T-units per sentence decreased. Since the mean number of T-units per sentence for the essays decreased while the means for the other four variables increased, it was determined that some growth in syntactic maturity occurred over the eight-month period separating the two groups of essays. In addition, the observed growth follows in general the same pattern as that reported in Hunt's study (1965) of the writing of students in the fourth, eighth, and twelfth grades and of skilled adults who had written professionally. Hunt's means are reproduced in Table 2.

VARIABLE	G4	G8	G12	S.A.
Words/T-units	8.6	11.5	14.4	20.3
Words/Clauses	6.6	8.1	8.6	11.5
Clauses/T-units	1.30	1.42	1.68	1.74
T-units/Sentences	1.60	1.37	1.17	1.24
Words/Sentences	13.5	15.9	16.9	24.7

Table 2. Means Reported by Hunt (1965) for the Five Indices of Syntactic Maturity.

Comparison of the means reported in Table 1 and Table 2 reveals that while the means for the present study differ somewhat from those reported by Hunt, words per T-unit, words per clause, and words per sentence for the second essays exceed the comparable means for Hunt's twelfth graders. On the other hand, T-units per sentence decreased in the present study from 1.1431 to 1.1146, a decrease which follows the pattern of decreasing means for Hunt's fourth, eighth, and twelfth graders but which does not parallel the increase in number of T-units per sentence which occurred between Hunt's twelfth graders and skilled adults. Similarly, the number of clauses per T-unit in the present study failed to equal or exceed the 1.68 which Hunt reported

for his twelfth graders, even though the means in the present study for that variable did increase over the eight-month period, again suggesting a pattern of growth comparable to that indicated by Hunt's figures. However, the number of clauses per T-unit for both essays in the present study did exceed the 1.60 which Loban (1976) reported for the number of clauses per syntactic unit for his group of twelfth graders.

Although growth was indicated along the dimensions of the five indices between the writing of the first and second essays, only the increase in the mean number of words per T-unit reached statistical significance at the .05 level when paired T-Tests were used to determine the significance of the changes. The results of these T-Tests are reported in Table 3.

VARIABLE	DIFFERENCE MEAN	T-VALUE	DF
Words/T-units	-1.2471	-2.10	23
Words/Clauses	-0.5217	-1.53	23
Clauses/T-units	-0.0264	-0.42	23
T-units/Sentences	0.0285	1.11	23
Words/Sentences	-0.9679	-1.47	23

Table 3. Results of Paired T-Tests of Gains.

For the gains to reach the .05 level of significance, a t-value of 2.069 was required with twenty-three degrees of freedom. Since the growth realized over the eight months separating the two essays was statistically significant only for mean words per T-unit, the sensitivity of that general index would appear to be reconfirmed. However, none of the five indices indicated the specific nature of the change that occurred.

To account more precisely for the growth which had occurred, we calculated the means for four additional variables—words per subordinate clause

(the number of clauses minus the number of T-units), number of words between embeddings of all kinds, number of words between prepositional embeddings, and the number of words between nonclausal and nonprepositional embeddings. The appropriate statistical data for each of these variables are reported in Table 4.

VARIABLE	MEAN	STANDARD DEVIATION	DIFFERENCE MEAN	T-VALUE	DF
Words/Sub. Clauses					
Essay 1	26.9158	18.186	2.0442	0.52	23
Essay 2	24.8716	6.529			
Words/Embeddings					
Essay 1	4.1290	0.559	0.0884	0.61	23
Essay 2	4.0406	0.505			
Words/Prep. emb.					
Essay 1	12.4440	2.084	2.3918	4.46	23
Essay 2	10.0521	1.421			
Words/Nonclausal, nonprep. emb.					
Essay 1	9.1222	3.626	-1.0207	-1.29	23
Essay 2	10.1429	3.330			

Table 4. Statistical Data for the Four Additional Variables.

Examination of Table 4 reveals that while the mean distance in words between nonclausal and nonprepositional embeddings increased over the eight-month period and while the distance between subordinate clauses, embeddings of all kinds, and prepositional embeddings decreased, the only statistically significant change occurred in the mean distance between prepositional embeddings. To be significant at the .05 level, a t-value of 2.069 is required with twenty-three degrees of freedom. With a t-value of 4.46 and twenty-three degrees of freedom, the change in the mean number of words between prepositional embeddings is significant beyond the .001 level.

Although the decreased distance between prepositional embeddings cannot

alone account for the longer T-units, the longer clauses, and the longer sentences of the second essays, it does explain part of that change. However, the increase in the number of prepositional phrases is partially offset by a decrease in the number of single-word adjective and adverbs, appositives, etc., as indicated by the increased distance between the nonclausal and nonprepositional embeddings. As is clear from the low t-values associated with the decreased distance between subordinate clauses and between all embeddings, neither of these variables appears sensitive enough to detect small growth in syntactic maturity over a relatively short period of time.

Our analyses of the data derived from the two essays indicate that syntactic maturity did increase for the twenty-four students over the eight-month period covered by this study. Our analyses also indicate that part of this increase is attributable to a larger number of subordinate clauses and a significantly higher percentage of prepositional embeddings in the second essay. Both of these gains are, of course, partially offset by a net loss in nonclausal and nonprepositional embeddings. Loss in this latter category should be a matter of some concern because that category contains the more sophisticated devices (i.e., adjectival usage, participial constructions, series, ellipsis, infinitives, and appositives) for acheiving sentence compactness. It should be pointed out that this variable and the two other variables which indicate embedding frequency may be useful in calculating more precisely than Hunt's variables syntactic gains over periods of time significantly longer than the eight months used in this study. That these variables may be profitably so used finds support in the fact that they clearly distinguished between the writing of the students and the writing of professionals published in People's Weekly, PMLA, Harper's, Time, the New York Times, and the Washington Post. For the 12,000 plus words of

professional writing we examined, the mean distance between all embeddings was 3.0078 words, between prepositional embeddings was 8.9967 words, and between nonclausal and nonprepositional embeddings was 5.82 words. These means differ considerably from the 4.0406, 10.0521, and 10.1429 which were computed for the second essays in our student sample. Nevertheless, Hunt's variables distinguished just as clearly, if not as precisely, between the student and the professional writers; and Hunt's variables are, we must observe, somewhat easier to compute.

Suggestions for Research and Teaching

Quite clearly, a great deal of research still needs to be done on the syntactic maturity of college freshman. Obviously, small studies such as this one need to be replicated for a wide range of student populations in different parts of the country. While such studies should ideally employ, for the purpose of comparison, a common set of variables, such as Hunt's five indices, there is a need to experiment with other variables capable of indicating more precisely the nature of the changes in syntactic maturity. Such studies should also describe as objectively as possible their sample populations and the courses in writing through which the population progressed as syntactic maturity increased. At the same time, claims for course effects should not be made unless abundant and reliable evidence is available to indicate that growth in syntactic maturity is in fact a function of the instuctional methodology and/or course design. We cannot, for example, claim on the basis of the present study that growth in syntactic maturity of our sample population is attributable to the two-course sequence through which the students progressed: we can only assume that it

had some effect on the growth. However, that growth could be attributed to the reading and writing the students did in other courses, to oral discourse situations which made greater demands on the students' command of language, to the greater chronological age of the students at the end of the study, or to a combination of any number of variables. Attention also needs to be given to the possible relationship between syntactic structures and discourse modes, for if students produce at one time a narrative and at another a piece of argumentative discourse, it seems a reasonable hypothesis that the proportion of different syntactic structures would vary from one mode to another.

With the present study perhaps raising more questions than it answers, we can draw from it implications for teaching which are at best highly conjectural. However, when the results of the present investigation are placed in the context of the studies by Mellon (1969), O'Hare (1973), and Combs (1976), it is reasonable to assume that greater growth may have been realized if our students had undergone systematic practice of the kind represented in Strong's Sentence-Combining (1973). Although research indicates that significant gains can be realized through the use of such instructional materials, research has not, it seems to us, shown that these gains can be maintained over a period of several years. That is another question demanding investigation. It may be that teachers of freshman writing need simply to devote more attention to the sentences written by their students, repeatedly showing each, in the context of his or her own writing, how to reduce clauses to less-than-clause status, how to subordinate ideas, how to make more concrete the propositions set forth in individual sentences. But that too is another issue requiring investigation.

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